

## CLAIMS

1. A sensor system for a disk device by using a floating head, comprising:

a rotating disk having a data recording area;

a head element that floats over the data recording area of the disk so as to write data thereon or read data therefrom;

a first actuator for moving the head element over the data recording area of the disk;

a second actuator being supported by the first actuator and supporting the head element for precise positioning thereof against the data recording area of the disk; and

a means for detecting any contact between the disk and the head element, by utilizing a signal generated by the second actuator when the disk contacts the head element during an operation of the disk.

2. The sensor system for a disk device by using a floating head according to Claim 1, wherein the second actuator is a piezoelectric element.

3. The sensor system for a disk device by using a floating head according to Claim 1 or Claim 2, wherein the second actuator is disposed on a load beam of a head suspension.

4. A flying height testing method for a disk device by using a floating head, comprising:

utilizing the sensor system for a disk device by using a

floating head according to Claim 1,

assuming a normal rotating speed of a disk during operation as a first rotating speed;

detecting a contact between a disk and a head element by utilizing a signal generated by the second actuator when the disk contacts the head element while the rotating speed of the disk is lowered, and assuming the rotating speed of the disk then as a second rotating speed; and

measuring a flying height of the head element based on a difference between the first rotating speed and the second rotating speed, under an assumption that a relation between the rotating speed of the disk and the flying height of the head element has been known.

5. A sensor system for a disk device by using a floating head, comprising:

a rotating disk having a data recording area;

a head element that floats over the data recording area of a disk so as to write data thereon or read data therefrom;

a first actuator for moving the head element over the data recording area of the disk; and

a second actuator supported by the first actuator and supporting the head element for precisely positioning the head element against the data recording area of the disk;

wherein

the head element is retreated from a disk surface by the first actuator when the disk is not in operation, and

the system further comprises a means for detecting a vibration disturbance by utilizing a signal generated by the second actuator due to this vibration disturbance, before the first actuator starts a loading operation of the head element onto the disk surface from a retreat position.

6. The sensor system for a disk device by using a floating head according to Claim 5, wherein the second actuator is a piezoelectric element.

7. The sensor system for a disk device by using a floating head according to Claim 5 or Claim 6, wherein the second actuator is disposed on a load beam of a head suspension.

8. A sensor system for a disk device by using a floating head, comprising:

a rotating disk having a data recording area;

a head element that floats over the data recording area of the disk so as to write data thereon or read data therefrom;

a first actuator for moving the head element over the data recording area of the disk;

a second actuator supported by the first actuator and supporting the head element for precisely positioning the head element against the data recording area of the disk; and

a means for canceling a resonance generated between the head element and the second actuator, by applying to the second actuator a signal having a phase opposite to that of a signal

generated by the second actuator when the head element is floating.

9. The sensor system for a disk device by using a floating head according to Claim 8, wherein the second actuator is a piezoelectric element.

10. The sensor system for a disk device by using a floating head according to Claim 8 or Claim 9, wherein the second actuator is disposed on a load beam of a head suspension system.

11. A sensor system for a disk device by using a floating head, including a single-plate servo writer, said servo writer comprising:

a head element that floats over a data recording area of a rotating disk so as to write servo information thereon or read servo information therefrom;

a first actuator for moving the head element over the data recording area of the disk;

a second actuator supported by the first actuator and supporting the head element for precisely positioning the head element against the data recording area of the disk; and

a means for detecting any contact between the disk and the head element, by utilizing a signal generated by the second actuator when the disk contacts the head element during an operation of the disk.

12. A sensor system for a disk device by using a floating head, including a single-plate servo writer, said servo writer comprising:

a head element that floats over a data recording area of a rotating disk so as to write servo information thereon or read servo information therefrom;

a first actuator for moving the head element over the data recording area of the disk; and

a second actuator supported by the first actuator and supporting the head element for precisely positioning the head element against the data recording area of the disk; and

a means for canceling a resonance generated between the head element and the second actuator by applying to the second actuator a signal having a phase opposite to that of a signal generated by the second actuator when the head element is floating.

13. A sensor system for a disk device by using a floating head, including a head tester, said head tester comprising:

a head element that floats over a data recording area of a rotating disk so as to write servo information thereon or read servo information therefrom;

a first actuator for moving the head element over the data recording area of the disk;

a second actuator supported by the first actuator and supporting the head element for precisely positioning the head element against the data recording area of the disk; and

a means for detecting any contact between the disk and the head element, by utilizing a signal generated by the second actuator when the disk contacts the head element during an operation of the disk.

14. A sensor system for a disk device by using a floating head, including a disk tester, said disk tester comprising:

a head element that floats over a data recording area of a rotating disk so as to write servo data thereon or read servo data therefrom;

a first actuator for moving the head element over the data recording area of the disk;

a second actuator supported by the first actuator and supporting the head element for precisely positioning the head element against the data recording area of the disk; and

a means for detecting any contact between the disk and the head element, by utilizing a signal generated by the second actuator when the disk contacts the head element during an operation of the disk.

15. The sensor system for a disk device by using a floating head according to Claim 14, wherein it is possible to measure a gliding height of the disk by changing a rotating speed of the disk.